

**VARIABLE-STRUCTURE DIAGNOSTICS APPROACH ACHIEVING
OPTIMIZED LOW-FREQUENCY DATA SAMPLING FOR EMA MOTORING
SUBSYSTEM**

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ABSTRACT OF THE DISCLOSURE

The present invention provides a diagnostics methodology and embedded electronic system that allows optimized low-frequency data sampling for EMA motoring subsystems in an operating vehicle. Each of the EMA 10 motoring subsystems includes: an EMA; at least one motor for driving the EMA; and power controls for operating the motor, wherein the power controls includes a DSP controller for sampling and processing data at low-frequency sampling rates. The diagnostic methodology includes a method that has the steps of: determining an operational mode of the EMA motoring subsystem; selecting a 15 sampling rate optimized for the determined operational mode; acquiring and processing data at the selected sampling rate; and analyzing the processed data to identify and classify a fault of the EMA motoring subsystem.